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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Masayuki MISHIMA

Appln. No.: 09/845,356

Confirmation No.: 2603

Filed: May 01, 2001

For: LIGHT-EMITTING DEVICE

Docket No: Q64324

Group Art Unit: 1774

Examiner: Marie Rose Yamnitsky

REPLY BRIEF PURSUANT TO 37 C.F.R. § 41.41

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § 41.41, Appellant respectfully submits this Reply Brief in response to the Examiner's Answer dated February 16, 2005. Entry of this Reply Brief is respectfully requested.

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STATUS OF CLAIMS

Claims 1-24 are canceled.

Claims 25-32 are pending in the application.

Claims 25-32 are rejected.

Claims 25-32 are being appealed. The claims in their entirety were provided in the Appendix attached to Appellant's Brief on Appeal filed January 5, 2005.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issue presented for review is whether the Examiner erred in rejecting claims 25-32 under 35 U.S.C. § 103(a) over Baldo et al. in *Appl. Phys. Lett.* 75(1), pp.4-6 (July 5, 1999) or Forrest et al. (US 6,310, 360 B1), either reference in view of Egusa et al. (US 5,294,810).

ARGUMENT

As a preliminary matter, at page 3 of the Examiner's Answer, the Examiner notes that present Claims 30-32 depend from Claim 28.

As Appellant pointed out, Claims 30-32 were previously inadvertently written to depend from Claim 28. This error will be corrected subsequently at an appropriate time.

In the *Response to Arguments* section of the Examiner's Answer, the Examiner repeats many of the same arguments set forth previously during the prosecution of the present application, and adds a few new arguments. In response, Appellant maintains that the present invention, as claimed, is patentable over the applied references at least based on the previously submitted arguments and the arguments in response to the Examiner's Answer set forth below.

1. At page 8 of the Examiner's Answer, last paragraph, the Examiner disagrees that the primary references do not disclose or suggest multiple light-emitting materials in the same or different layer as the layer comprising the iridium complex. The Examiner states that "Each of the primary references clearly discloses at least two light-emitting materials per device, one of the light emitting-materials being an iridium complex."

In response, Appellant maintains that CBP in Baldo's device and $Ir(ppy)_3$ in Forrest's device were not used as light-emitting materials, and thus do not qualify as light-emitting materials within the scope of the present invention. Specifically, CBP is provided in Baldo's device to achieve efficient energy transfer. As the Examiner noted, the blue light-emission provided by CBP in Baldo's device is minimal. See page 11 of the Examiner's Answer. Further,

$Ir(ppy)_3$ is provided in Forrest's device as a phosphorescent sensitizer to improve the efficiency of fluorescence processes.

2. At page 9 of the Examiner's Answer, the Examiner asserts that "The primary references establish that an orthometallated complex is a suitable light-emitting material for an organic EL device, [and that] the secondary reference establishes that an organic EL device that emits white light can be obtained by selecting an appropriate combination of light-emitting materials, including combinations of red, green and blue light-emitting materials." According to the Examiner, "The motivation to combine the references lies in the advantages attainable by the use of an orthometallated iridium complex taught by the primary references and the ability to modify the color of the light emitted from the device taught by the secondary reference."

The Examiner further asserts that "One of ordinary skill in the art at the time of the invention would readily presume and recognize that red, green and blue light-emission (and thus, red, green and blue light-emission intensities) could be obtained from red, green and blue light-emitting materials, respectively." Page 10 of the Examiner's Answer, last paragraph.

In response, Appellant respectfully submits that Forrest does not establish that an orthometallated complex is a suitable light-emitting material for an organic EL device, as the Examiner asserted. Specifically, in Forrest's device, $Ir(ppy)_3$, the orthomatallated complex, was not used as a green light-emitting material. In fact, using $Ir(ppy)_3$ as a green light-emitting material in Forrest's device would render it unsatisfactory for its purposes.

With respect to Egusa et al, Appellant maintains that Egusa et al does not teach obtaining a white light-emitting device by using red, green and blue light-emitting materials. In fact,

Egusa et al describes that white light emission may be obtained by controlling light emission intensities of red, green and blue among many wavelengths (col. 26, lines 22-28). Therefore, Egusa et al does not disclose or suggest obtaining white light-emission by the combination of red, green and blue-light emitting materials.

In fact, many wavelengths may be generated by combinations of numerous light-emitting materials. The combination of red, green and blue light-emitting materials is merely a subgroup of the large genus. Egusa et al fails to suggest using red, green and blue light-emitting materials. Egusa et al does not provide any guidance or preference to choose the combination of red, green and blue light-emitting materials of the many combinations available.

Accordingly, the Examiner is clearly wrong in asserting that "One of ordinary skill in the art at the time of the invention would readily presume and recognize that red, green and blue light-emission (and thus, red, green and blue light-emission intensities) could be obtained from red, green and blue light-emitting materials, respectively," in view of the disclosure of Egusa et al. The Examiner's statement does not adequately address the issue of motivation to combine. The question of motivation could not be resolved on subjective belief and unknown authority.

3. At page 11 of the Examiner's Answer, 1st paragraph, the Examiner asserts that "One of ordinary skill in the art would have been motivated to add an additional material capable of emitting blue light and an additional material capable of emitting red light in sufficient quantities to control the light-emission intensities of the various light-emitting materials [taught by Egusa et al] in Baldo's device to provide white light emission."

The Examiner's position appears to be that in order to obtain white light emission, (i) there must be red, green and blue light-emitting materials and (ii) the quantities of the red, green and blue light-emitting materials should be adjusted to control the light-emission intensities.

In response, Appellant respectfully disagrees. First, as set forth above, Egusa et al does not disclose or suggest obtaining white light emission by the combination of red, green and blue light-emitting materials. Second, Egusa et al does not disclose or suggest controlling red, green and blue light-emission intensities by adjusting the quantities thereof. Accordingly, there is no motivation to combine Baldo and Egusa et al in the manner suggested by the Examiner.

In further response, present Claims 26-27 and 30-31 require two or three light-emitting orthometallated complexes. In contrast, neither Baldo nor Egusa et al disclose or suggest a red or blue light-emitting orthomatallated complex. Therefore, even if a *prima facie* case of obviousness could be established, which the Examiner has not done, the combination of Baldo and Egusa et al would not result in the present invention having two or three two light-emitting orthometallated complexes. For this reason independently, Appellant respectfully submits that present Claims 26-27 and 30-31 are patentable over Baldo and Egusa et al and that the rejection should be reversed.

The Examiner also criticizes that the footnote at page 15 of Appellant's Brief is unclear. See page 11 of the Examiner's Answer, 2nd paragraph.

In response, Appellant submits that the addition of a red light-emitting material in Baldo's device containing $Ir(ppy)_3$, a green light-emitting material, and CPB, a blue light-

emitting material, may not produce white light. This is because in Baldo's device, CPB does not work as a blue light-emitting material.

4. At page 12 of the Examiner's Answer, 1st paragraph, the Examiner asserts that "While the green light-emission provided by $Ir(ppy)_3$ in Forrest's device is less than the red light-emission provided by DCM2, one of ordinary skill in the art at the time of the invention would be motivated to add an additional material capable of emitting blue light and an additional material capable of emitting green light in sufficient relative quantities to control the light-emission intensities of the various light-emitting materials [taught by Egusa et al] in Forrest's device to provide white light emission."

The Examiner's position appears to be that in order to obtain white light emission, (i) there must be red, green and blue light-emitting materials and (ii) the quantities of the red, green and blue light-emitting materials should be adjusted to control the light-emission intensities.

In response, Appellant respectfully disagree. First, as set forth above, Egusa et al does not disclose or suggest obtaining white light emission by the combination of red, green and blue light-emitting materials. Second, Egusa et al does not disclose or suggest controlling red, green and blue light-emission intensities by adjusting the quantities thereof. Accordingly, there is no motivation to combine Forrest and Egusa et al in the manner suggested by the Examiner.

In further response, the present claims require one, two or three light-emitting orthometallated complexes. As set forth above, in Forrest's device, $Ir(ppy)_3$, an orthometallated complex, was not used as a green light-emitting material. That is, Forrest does not teach or suggest a green light-emitting orthometallated material. Additionally, Forrest does not disclose

or suggest a red or blue light-emitting orthometallated complex. Therefore, even if a *prima facie* case of obviousness could be established, which the Examiner has not done, the combination of Forrest and Egusa et al would not result in the present invention having one, two or three light-emitting orthometallated complexes. For this reason independently, Appellant respectfully submits that the present claims are patentable over Forrest and Egusa et al and that the rejection should be reversed.

5. At page 12 of the Examiner's Answer, 2nd paragraph, the Examiner disagrees that modification of the primary references would render the devices unsatisfactory for their intended purposes. The Examiner states that "Modification to alter the color of light would not render the devices unsuitable for light emission."

In response, Appellant believes that the Examiner misunderstands the intended purposes of Baldo's and Forrest's devices. Specifically, the Examiner's position in the previous Office Action was that Baldo's device contains green and blue light-emitting materials, i.e., $Ir(ppy)_3$ and CBP, and Forrest's device contains green and red light-emitting materials, i.e., $Ir(ppy)_3$ and DCM2, and, therefore, the addition of a red light-emitting material in Baldo's device and a blue light-emitting material in Forrest's device would produce white light.

The intended purpose of Baldo was to achieve efficient transfer by using CBP as a host for $Ir(ppy)_3$, and not a light-emitting material. Specifically, the use of CBP as the host material avoids concentration quenching and achieves efficient transfer of both singlet and triplet excited states in the host to $Ir(ppy)_3$. See Abstract and page 4, right column of Baldo.

The intended purpose of Forrest was to enhance emission efficiency of DCM2 by using $Ir(ppy)_3$ as an intersystem crossing agent and not a green light-emitting material. Specifically, $Ir(ppy)_3$, a phosphorescent intersystem crossing agent, traps the energy of excitons and transfers the energy to a red fluorescent emitter, i.e., DCM2, by a Forster energy transfer. See page 3, left column, 1st paragraph and right column, last full paragraph of Forrest.

In Appellant's Brief on Appeal, Appellant argued that using CBP as a blue light-emitting material in Baldo's device, as asserted by the Examiner, would render Baldo's device unsatisfactory for its intended purpose of achieving efficient transfer, and similarly, using $Ir(ppy)_3$ as a green light-emitting material in Forrest's device, as asserted by the Examiner, would render Forrest's device unsatisfactory for its intended purpose of enhancing emission efficiency of DCM2. See page 20, 1st paragraph and page 23, last paragraph of the Brief. One of ordinary skill in the art at the time of the invention would not readily recognize CBP as a blue light-emitting material in Baldo's device and $Ir(ppy)_3$ as a green light-emitting material in Forrest's device. There is no motivation to modify the color of light. The primary references do not provide any reasonable expectation of success in arriving at the present invention.

6. In the paragraph bridging pages 12 and 13 of the Examiner's Answer, the Examiner disagrees with Appellant's argument that selection of combination of red, green and blue light-emitting materials is not routine experimentation. The Examiner notes that "Various light-emitting materials suggested for use by the present specification are known materials." Further, the Examiner criticizes that none of the working examples meet the limitations of Claims 27 and 31, thus raising an enablement issue.

In response, Appellant respectfully submits that Appellant's above argument was made in view of the disclosures of the prior art and not the disclosure of the present application. For example, Baldo's device contains $Ir(ppy)_3$, a green light-emitting material and CBP, a blue light-emitting material. However, CBP was not used as a blue light-emitting material in Baldo's device. Baldo's device emits green light. Accordingly, the addition of an additional red light-emitting material would not produce white light.

Similarly, Forrest's device contains $Ir(ppy)_3$, a green light-emitting material and DCM2, a red light-emitting material. However, $Ir(ppy)_3$ was not used as a green light-emitting material in Forrest's device. Forrest's device emits red light. Accordingly, the addition of an additional blue light-emitting material would not produce white light.

In further response, as set forth above, the light-emitting compositions emitting light of many wavelengths disclosed in Egusa et al encompass a large number of combinations of numerous available light-emitting materials, among which the combination of red, green and blue-light emitting materials is merely a subgroup. Egusa et al does not provide any guidance in choosing that particular subgroup.

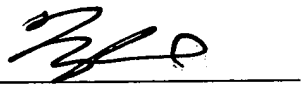
Accordingly, Appellant maintains that selection of combination of red, green and blue light-emitting materials is not routine experimentation in view of the disclosures of the cited prior art.

CONCLUSION

For the above reasons as well as the reasons set forth in Appeal Brief, Appellant respectfully requests that the Board reverse the Examiner's rejections of all claims on Appeal.

An early and favorable decision on the merits of this Appeal is respectfully requested.

Respectfully submitted,



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